Appendix D
CLP/SOW OLC02.1/Low Concentration Semivolatile Organic Analysis
Method QC criteria, Equations, and Definitions

APPENDIX D

The following method QC criteria, equations, and definitions apply to data generated according to the **USEPA CLP Statement of Work for Organic Analysis, Low Concentration Water, OLC02.1, Exhibit D Semivolatiles**.

Note: MS/MSD are not applicable. MS/MSDs are not required for work under this SOW.

Capillary GC columns are mandatory. Packed columns cannot be used.

SECTION I: PRESERVATION & TECHNICAL HOLDING TIME CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-I-B for preservation and technical holding time data validation criteria.

SECTION II: GC/MS INSTRUMENT PERFORMANCE CHECK (TUNING) CRITERIA

Refer to the following method GC/MS instrument performance (tuning) QC criteria for data validation:

The analysis of the instrument performance (tuning) check solution (50 ng DFTPP on column) must be performed at the beginning of each **12-hour** period during which samples or standards are analyzed. The tuning check, decafluorotriphenylphosphine (DFTPP), for semivolatile analysis must meet the ion abundance criteria given below:

m/z	ION ABUNDANCE CRITERIA
51	30.0 - 80.0% of m/z 198
68	Less than 2.0% of m/z 69
69	Present
70	Less than 2.0% of m/z 69
127	25.0 - 75.0% of m/z 198
197	Less than 1.0% of m/z 198
198	Base Peak, 100% Relative Abundance (see note)
199	5.0 - 9.0% of m/z 198
275	10.0 - 30.0% of m/z 198
365	Greater than 0.75% of m/z 198
441	Present, but less than m/z 443
442	40.0 - 110.0% of m/z 198
443	15.0 - 24.0% of m/z 442

Note: All ion abundances must be normalized to m/z 198, the nominal base peak, even though the ion abundances of m/z 442 may be up to 110% that of m/z 198.

The mass spectrum of DFTPP must be acquired in the following manner. Three scans (the peak apex scan and the scans immediately preceding and following the apex) are acquired and averaged. Background subtraction is required and must be accomplished using a single scan no more than 20 scans prior to the elution of DFTPP. Part of the DFTPP peak must not be background subtracted.

SECTION III: INITIAL CALIBRATION CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-III-B for initial calibration data validation criteria and the following method initial calibration QC criteria:

The initial calibration standards must be analyzed upon contract award, whenever corrective action is taken which may change or affect the initial calibration criteria or if the continuing calibration acceptance criteria have not been met. Initial calibrations must be analyzed after the analysis of a compliant instrument performance check.

The initial calibration standards must include the target compounds listed in the Target Compound List (TCL) in Section XIII of this Appendix, as well as the internal standards and the system monitoring compounds.

1 uL volume of the initial calibration standard must be injected and all initial calibration standards must be analyzed at the following concentration levels; 5.0, 10, 20, 50, and 80 ng/uL except for eight target compounds and one surrogate compound. Compounds 2,4-dinitrophenol, 2,4,5-trichlorophenol, 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 4-nitrophenol, 4-6-dinitro-2-methylphenol, pentachlorophenol, and 2,4,6-tribromophenol(surr.) must be analyzed at 20, 50, 80, 10, and 120 ng/uL.

RELATIVE RESPONSE FACTOR (RRF) - A measure of the relative mass spectral response of an analyte compared to its internal standard. The RRF is calculated using the following equation:

$$RRF = \frac{A_x}{A_{is}} \times \frac{C_{is}}{C_x}$$

Where,

A_x	=	Area of primary quantitation ion response (EICP) for the compound to be measured
A_{is}	=	Area of primary quantitation ion response (EICP) for the internal standard
C_{is}	=	Concentration of the internal standard
C_x	=	Concentration of the compound to be measured

AVERAGE (MEAN) RELATIVE RESPONSE FACTOR (RRF) - The average or mean RRF is determined by the analysis of five different standard concentrations and is used in calculating a compound concentration in samples. The RRF is calculated using the following equation:

$$\overline{RRF} = \sum_{i=1}^{n} \frac{RRF_i}{n}$$

Where,

RRF_i	=	The individual RRFs for various concentration levels
n	=	The number of RRFs

PERCENT RELATIVE STANDARD DEVIATION (%RSD) - The % RSD for each compound is a measure of the linearity of the calibration curve. The % RSD is calculated using the following equation:

$$\%RSD = \frac{Standard\ Deviation}{Mean} \times 100$$

Where,

$$Standard\ Deviation = \sqrt{\sum_{i=1}^{n} \frac{(x_i - \bar{x})^2}{(n-1)}}$$

$\bar{x}$ = Mean
n = total number of values
x_i= each individual value used to calculate the mean

SECTION IV: CONTINUING CALIBRATION CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-IV-B for continuing calibration data validation criteria and the following method continuing calibration QC criteria:

The continuing calibration standard must be analyzed once every 12 hours, following the analysis of a compliant instrument performance check and initial calibration, and prior to the analysis of field samples, QC samples and blanks.

The continuing calibration standard must include the target compounds listed in the Target Compound List (TCL) in Section XIII of this Appendix, as well as the internal standards and the system monitoring compounds.

Continuing calibration standards must be analyzed at a final concentration of 20 ug/L for the majority of the compounds and 80 ug/L for the eight compounds specified in the initial calibration section.

Note: The Low Concentration method % Difference QC criteria for continuing calibration differs somewhat from the Region I Functional Guidelines continuing calibration % Difference criteria. The Low Concentration method requires that the continuing calibration % Difference be less than or equal to ±30.0% for two compounds, 2-nitrophenol and 2,4,-dimethylphenol; whereas the Functional Guidelines requires qualification of all data associated with a continuing calibration with % Difference greater than ± 25.0%. Refer to CLP SOW OLC02.1 for those compounds that do not have % D requirements. If data quality objectives allow for greater variability of data, then expanded % D validation criteria should be documented in the site-specific QAPjP or amendment to the QAPjP.

PERCENT DIFFERENCE (%D) - The % D is used to compare the initial calibration mean RRF with the continuing calibration RRF. The % Difference indicates both the direction and the magnitude of the comparison, i.e., the % Difference may be either negative, positive or zero.

$$\%\ Difference = \frac{RRF_c - \overline{RRF_i}}{\overline{RRF_i}} \times 100$$

Where,

$\overline{RRF_i}$ = Mean relative response factor from the most recent initial calibration meeting technical acceptance criteria

RRF_c = Relative response factor from continuing calibration standard

SECTION V: BLANK CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-V-B for blank data validation criteria and the following method QC criteria:

Method Required Blank

Method Blank - A volume of reagent water approximate in volume to the samples which is carried through the entire analytical process to determine the levels of contamination associated with the processing and analysis of the samples. All blanks are spiked with internal standard and surrogate compounds and blank analysis must meet internal standard and surrogate compound criteria. A method blank must be extracted at least once for every SDG, for each 20 samples in an SDG, and whenever samples are extracted. Each method blank must be analyzed on each GC/MS used to analyzed the samples prepared with the method blank.

SECTION VI: SURROGATE COMPOUND CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-VI-B for surrogate compound data validation criteria and the following method surrogate compound QC criteria:

Surrogate compounds must be quantified using the correctly assigned internal standards and the correct primary quantitation ions.

Surrogate compounds Nitrobenzene-d_5, 2-Fluorobiphenyl, Terphenyl-d_{14}, Phenol-d_5, and 2-Fluorophenol are added to all samples, standards, QC samples, and blanks at a concentration of 40 ug/mL and surrogate compound 2,4,6-Tribromophenol is added to all samples, standards, QC samples, and blanks at a concentration of 120 ug/mL.

Phenol-d_5	99	42, 71	1,4-Dichlorobenzene-d_4
2-Fluorophenol	112	64	1,4-Dichlorobenzene-d_4
2,4,6-Tribromophenol	330	332, 141	Phenanthrene-d_{10}

The surrogate % recovery is calculated using the following equation:

$$Surrogate\ Percent\ Recovery = \frac{Q_d}{Q_a} \times 100\%$$

Q_d = Quantity of surrogate determined by analysis

Q_a = Quantity of surrogate added to sample/blank

Table App.E.VI-2 - SURROGATE RECOVERY LIMITS

Surrogate	**Method QC Criteria**
	Percent Recovery (Water)
Nitrobenzene-d_5	40-110
2-Fluorobiphenyl	30-110
Terphenyl-d_{14}	20-140
Phenol-d_5	15-115
2-Fluorophenol	15-110
2,4,6-Tribromophenol	15-130

If the surrogate acceptance criteria are not met, the laboratory should check calculations, surrogate standard solutions, and instrument performance. If the failed criteria are the result of instrument malfunction, only sample reanalysis is required to meet surrogate acceptance criteria. Sample re-extraction/reanalysis is required for samples that do not meet the surrogate recovery acceptance criteria, as a result of the incorrect surrogate standard solutions or any other unknown problem.

SECTION VII: INTERNAL STANDARDS CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-VII-B for internal standard data validation criteria and the following method internal standard QC criteria:

The correct internal standard must be used for sample compound quantification and the correct internal standard primary quantitation ion must be used for quantitation.

The internal standard compounds listed below are injected into all samples, standards, QC samples, and blanks at a concentration of 20 ng/uL.

App.E.VII-1 - LOW CONCENTRATION SEMIVOLATILE INTERNAL STANDARDS WITH CORRESPONDING TARGET COMPOUNDS AND SURROGATES ASSIGNED FOR QUANTITATION

IS 1,4)Dichlorobenzene)d4	IS Naphthalene)d8	IS Acenaphthene)d10	IS Phenanthrene)d10	IS Chrysene)d12	IS Perylene)d12	IS
Phenol	Nitrobenzene	Hexachlorocyclo) pentadiene	4,6)Dinitro)2) methylphenol	Pyrene	Di)n)octyl- phthalate	
bis(2)Chloroethyl) ether	Isophorone			Butylbenzyl- phthalate		
2)Chlorophenol	2)Nitrophenol	2,4,6)Trichloro) phenol	N)nitroso-di) phenylamine	3,3')Dichloro) benzidine	Benzo(b)fluor) anthene	
2-Methylphenol	2,4)Dimethyl) phenol					
2,2'-oxybis- (1-Chloropropane)	bis(2)Chloro) ethoxy)methane	2,4,5)Trichloro) phenol	4)Bromophenyl phenolether	Benzo(a)) anthracene	Benzo(k)fluor) anthene	
4)Methylphenol	2,4)Dichloro) phenol	2)Chloronaphthalene	Hexachloro) benzene	Benzo(a)pyrene		
N-Nitroso-Di-n- propylamine	Dimethylphthalate	2)Nitroaniline	bis(2)ethyl- hexyl)phthalate	Indeno(1,2,3)cd)- pyrene		
Hexachloroethane	Naphthalene	Dimethylphthalate	Pentachloro) phenol	Chrysene	Dibenz(a,h)- anthracene	
2-Fluorophenol (surr)	4-Chloroaniline	Acenaphthylene	Phenanthrene	Terphenyl)d14 (surr)	Benzo(g,h,i)- perylene	
Phenol-d5	Hexachloro) butadiene	3)Nitroaniline	Anthracene			(s u r r)
	4)Chloro)3) methylphenol	Acenaphthene	Di-n-butyl- phthalate			
	2-Methylnaph- thalene	2,4)Dinitrophenol	Fluoranthene			
	Nitrobenzene-d5 (surr)	4)Nitrophenol	2,4,6-Tribromo- phenol (surr)			
		Dibenzofuran				
		2,4)Dinitrotoluene				
		2,6)Dinitrotoluene				
		Diethylphthalate				
		4)Chlorophenyl- phenylether				
		Fluorene				
		4)Nitroaniline				
		2)Fluorobiphenyl (surr)				

(surr) = surrogate compound

Table App.E.VII-2 - CHARACTERISTIC IONS FOR INTERNAL STANDARDS FOR LOW CONCENTRATION SEMIVOLATILE COMPOUNDS

Internal Standard	Characteristic Ions	
	Primary Quantitation Ion	Secondary Ion(s)
1,4-Dichlorobenzene-d_4	152	115
Naphthalene-d_8	136	68
Acenaphthene-d_{10}	164	162, 160
Phenanthrene-d_{10}	188	94, 80
Chrysene-d_{12}	240	120, 236
Perylene-d_{12}	264	260, 265

Internal standard area counts for each of the internal standards must be within the inclusive range of - 50% and + 100% of the response of internal standards in the associated daily continuing calibration standard.

The retention time of the internal standard must not vary by more than ± 20 seconds from the retention time of the associated daily continuing calibration standard.

If the internal standard acceptance criteria are not met, the laboratory should check calculations, internal standard solutions, and instrument performance. If the failed criteria are the result of instrument malfunction, only sample reanalysis is required to meet surrogate acceptance criteria. Sample reanalysis is required for samples that do not meet the internal standard acceptance criteria, as a result of the incorrect internal standard solutions or any other unknown problem.

SECTION VIII: MATRIX SPIKE/MATRIX SPIKE DUPLICATE CRITERIA

The Low Concentration method does not require MS/MSD analysis therefore, no method-specific criteria are available for MS/MSD. Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-VIII-B for MS/MSD validation criteria, if MS/MSD analyses are performed.

SECTION IX: FIELD DUPLICATE CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-IX-B for field duplicate data validation criteria.

SECTION X: SENSITIVITY CHECK CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-X-B for sensitivity check data validation criteria.

SECTION XI: PE SAMPLES - ACCURACY CHECK CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-XI-B for accuracy check data validation criteria.

The LCS is a method required internal laboratory quality control sample that must be prepared, analyzed and reported once per SDG. It must be prepared and analyzed concurrently with the samples in the SDG using the same instrumentation as the samples.

Compound	Final Concentration ug/L	Method Required QC % Recovery Limits
Phenol	40.0	40 - 120
2-Chlorophenol	40.0	50 - 110
4-Chloroaniline	40.0	10 - 120
2,4,6-Trichlorophenol	40.0	40 - 120
bis(2-Chloroethyl)ether	20.0	50 - 110
N-Nitroso-di-n-propylamine	20.0	30 - 110
Hexachloroethane	20.0	20 - 110
Isophorone	20.0	50 - 110
Naphthalene	20.0	30 - 110
2,4-Dinitrotoluene	20.0	30 - 120
Diethylphthalate	20.0	50 - 120
N-Nitrosodiphenylamine	20.0	30 - 110
Hexachlorobenzene	20.0	40 - 120
Benzo(a)pyrene	20.0	50 - 120

SECTION XII: TARGET COMPOUND IDENTIFICATION CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-XII-B for target compound identification data validation criteria.

SECTION XIII: COMPOUND QUANTITATION AND REPORTED QUANTITATION LIMIT CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-XIII-B for compound quantitation and reported quantitation limit data validation criteria and the following method quantitation QC criteria:

Semivolatile target compounds must be quantitated using the internal standard method with the internal standards assigned in Appendix E, Section VII. The daily RRF20 must be used for sample quantitation. The sample target compounds must be quantified using the following primary quantitation ions and must be reported to the CRQLs listed below:

App.E.XIII-1 - TARGET COMPOUND LIST (TCL), CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs), PRIMARY QUANTITATION IONS, AND SECONDARY IONS FOR OLCO2.0 SOW SEMIVOLATILE ORGANIC COMPOUNDS

		Quantitation Limits		
		Water	Characteristic Ions	
Semivolatiles	CAS Number	ug/L	Primary	Secondary
Phenol	108)95)2	5	94	65, 66
bis(2)Chloroethyl) ether	111)44)4	5	93	63, 95
2)Chlorophenol	95)57)8	5	128	64, 130
2)Methylphenol	95)48)7	5	108	107
2,2'-oxybis (1-Chloropropane)#	108)60)1	5	45	77, 79
4)Methylphenol	106)44)5	5	108	107
N)Nitroso)di)n-propylamine	621)64)7	5	70	42, 101, 130
Hexachloroethane	67)72)1	5	117	201, 199
Nitrobenzene	98)95)3	5	77	123, 65
Isophorone	78)59)1	5	82	95, 138
2)Nitrophenol	88)75)5	5	139	65, 109
2,4)Dimethylphenol	105)67)9	5	107	121, 122
bis(2)Chloroethoxy) methane	111)91)1	5	93	95, 123
2,4)Dichlorophenol	120)83)2	5	162	164, 98
Naphthalene	91)20)3	5	128	129, 127
4)Chloroaniline	106)47)8	5	127	129
Hexachlorobutadiene	87)68)3	5	225	223, 227
4)Chloro)3)methylphenol	59)50)7	5	107	144, 142
2)Methylnaphthalene	91)57)6	5	142	141
Hexachlorocyclopentadiene	77)47)4	5	237	235, 272
2,4,6)Trichlorophenol	88)06)2	5	196	198, 200
2,4,5)Trichlorophenol	95)95)4	20	196	198, 200
2)Chloronaphthalene	91)58)7	5	162	164, 127
2)Nitroaniline	88)74)4	20	65	92, 138
Dimethylphthalate	131)11)3	5	163	194, 164
Acenaphthylene	208)96)8	5	152	151, 153
2,6)Dinitrotoluene	606)20)2	5	165	89, 121
3)Nitroaniline	99)09)2	20	138	108, 92
Acenaphthene	83)32)9	5	153	152, 154
2,4)Dinitrophenol	51)28)5	20	184	63, 154

Previously known by the name bis(2-Chloroisopropyl) ether

App.E.XIII-1 - TARGET COMPOUND LIST (TCL), CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs), PRIMARY QUANTITATION IONS, AND SECONDARY IONS FOR OLCO2. SOW SEMIVOLATILE ORGANIC COMPOUNDS (CONT.)

		Quantitation Limits		
			Water	Characteristic Ions
Semivolatiles	CAS Number	ug/L	Primary	Secondary
4)Nitrophenol	100)02)7	20	109	139, 65
Dibenzofuran	132)64)9	5	168	139
2,4)Dinitrotoluene	121)14)2	5	165	63, 182
Diethylphthalate	84)66)2	5	149	177, 150
4)Chlorophenyl)phenylether	7005)72)3	5	204	206, 141
Fluorene	86)73)7	5	166	165, 167
4)Nitroaniline	100)01)6	20	138	92, 108
4,6)Dinitro)2)methylphenol	534)52)1	20	198	182, 77
N)nitrosodiphenylamine	86)30)6	5	169	168, 167
4)Bromophenyl)phenylether	101)55)3	5	248	250, 141
Hexachlorobenzene	118)74)1	5	284	142, 249
Pentachlorophenol	87)86)5	20	266	264, 268
Phenanthrene	85)01)8	5	178	179, 176
Anthracene	120)12)7	5	178	179, 176
Di)n)butylphthalate	84)74)2	5	149	150, 104
Fluoranthene	206)44)0	5	202	101, 100
Pyrene	129)00)0	5	202	101, 100
Butylbenzylphthalate	85)68)7	5	149	91, 206
3,3')Dichlorobenzidine	91)94)1	5	252	254, 126
Benzo(a)anthracene	56)55)3	5	228	229, 226
Chrysene	218)01)9	5	228	226, 229
bis(2)Ethylhexyl)phthalate	117)81)7	5	149	167, 279
Di)n)octylphthalate	117)84)0	5	149	---
Benzo(b)fluoranthene	205)99)2	5	252	253, 125
Benzo(k)fluoranthene	207)08)9	5	252	253, 125
Benzo(a)pyrene	50)32)8	5	252	253, 125
Indeno(1,2,3)cd)pyrene	193)39)5	5	276	138, 227
Dibenz(a,h)anthracene	53)70)3	5	278	139, 279
Benzo(g,h,i)perylene	191)24)2	5	276	138, 277

SAMPLE CONCENTRATION - The amount of analyte present in a sample is calculated using the RRF20 of the continuing calibration standard in the following equation:

Sample concentration for water:

$$ug/L = \frac{(A_x)(IS)(V_t)(Df)}{(A_{is})(RRF)(V_o)(V_i)}$$

Where,

A_x = Area of the primary quantitation ion response (EICP) for the compound to be measured
A_{is} = Area of the primary quantitation ion response (EICP) for the specific internal standard
IS = Amount of internal standard added in nanograms (ng)
RRF = The Relative Response Factor from the most recent continuing calibration standard
Df = Dilution Factor - The dilution factor for analysis of water samples for semivolatiles by this method is defined as follows:

$$\frac{\text{uL most conc. extract used to make dilution + uL clean solvent}}{\text{uL most conc. extract used to make dilution}}$$

If no dilution is performed, Df = 1.
V_t = Volume of the concentrated final extract in microliters (uL)
V_o = Volume of water extracted in milliliters (mL)
V_i = Volume of extract injected in microliters (uL)

CRQL CALCULATIONS

Water:

$$Adjusted\ CRQL = Contract\ CRQL \times \frac{(V_x)(V_t)(V_y)(Df)}{(V_o)(V_c)(V_i)}$$

Where,

V_t, V_o, V_i and Df are defined in the sample concentration equation above
V_x = Contract sample volume (1000 mL)
V_y = Contract injection volume (1 uL)
V_c = Contract concentrated extract volume (1000 uL)

SECTION XIV: TENTATIVELY IDENTIFIED COMPOUND CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-XIV-B for tentatively identified compound (TIC) data validation criteria and the following method TIC QC criteria:

The validator is required to report up to 30 TICs in the Data Validation Memorandum.

TENTATIVELY IDENTIFIED COMPOUND CONCENTRATION - the estimated concentration for non-target compounds tentatively identified shall be determined by the internal standard method using the following equations:

Sample concentration for water:

$$ug/L \ , \ \frac{(A_x)(IS)(V_t)(Df)}{(A_{is})(RRF)(V_o)(V_i)}$$

Where,

A_x = Area of the primary quantitation ion response (EICP) for the non-target compound to be measured
A_{is} = Area of the primary quantitation ion response (EICP) for the specific internal standard
IS = Amount of internal standard added in nanograms (ng)
RRF = Relative Response Factor of 1 (one) is assumed
Df = Dilution Factor - The dilution factor for analysis of water samples for semivolatiles by this method is defined as follows:

$$\frac{\text{uL most conc. extract used to make dilution + uL clean solvent}}{\text{uL most conc. extract used to make dilution}}$$

If no dilution is performed, Df = 1.1
V_t = Volume of the concentrated final extract in microliters (uL)
V_o = Volume of water extracted in milliliters (mL)
V_i = Volume of extract injected in microliters (uL)

SECTION XV: SEMIVOLATILE CLEANUP CRITERIA

Not applicable to low concentration semivolatile analysis.

SECTION XVI: SYSTEM PERFORMANCE CRITERIA

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-XVI-B for system performance data validation criteria.

SECTION XVII: OVERALL ASSESSMENT

Refer to Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Section VOA/SV-XVII-B for overall assessment data validation criteria.